

CLAIMS

1. A process for reducing the levels of undesirable impurities in a mesotrione sample, said process comprising the steps of:
 - 5 (i) forming a mesotrione enolate solution in an aqueous solvent,
 - (ii) carrying out one or more purification processes, and
 - (iii) crystallising the purified mesotrione out of solution.
- 10 2. A process according to claim 1, wherein the process further comprises a distillation step.
- 15 3. A process according to claim 1 or 2, wherein the one or more purification processes are selected from the group consisting of filtration, adsorption treatment, extraction with an organic solvent, and decantation.
4. A process for reducing the levels of undesirable impurities in a mesotrione sample, said process comprising: a distillation step, formation of a mesotrione enolate solution; one or more purification steps; and crystallisation of mesotrione.
- 20 5. A process for reducing the levels of undesirable impurities in a mesotrione sample, said process comprising: formation of a mesotrione enolate solution; decantation, filtration and adsorption treatment carried out in any order; and crystallisation of mesotrione.
- 25 6. An integrated manufacturing/purification process for mesotrione, said process comprising the steps of:
 - (i) reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione;
 - 30 (ii) formation of mesotrione enolate in aqueous solution;

- (iii) carrying out one or more purification processes, and
 - (iv) crystallising the purified mesotrione out of solution.
- 5 7. A process according to claim 6, wherein said process further comprises a distillation step.
8. A process according to claim 6 or 7, wherein the NMSBC is first subjected to a carbon purification treatment.
- 10 9. An integrated manufacturing/purification process for mesotrione, said process comprising: reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione; a distillation step; formation of a mesotrione enolate solution; one or more purification steps; and crystallisation of mesotrione.
- 15 10. An integrated manufacturing/purification process for mesotrione, said process comprising reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione; formation of a mesotrione enolate solution; decantation, filtration and
- 20 adsorption treatment, carried out in any order; and crystallisation of mesotrione.
11. A process for preparing mesotrione, said method comprising:
- (i) Oxidation of NMST to give crude NMSBA;
 - (ii) conversion of NMSBA to NMSBC;
 - 25 (iii) reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione;
 - (iv) formation of mesotrione enolate in aqueous solution;
 - (v) carrying out one or more purification processes, and
 - 30 (vi) crystallising the purified mesotrione out of solution.

12. The method of claim 11, wherein the process further comprises partial purification of the crude NMSBA.
- 5 13. The method of claim 11 or 12, wherein the process further comprises a distillation step.
14. A process for preparing mesotrione, said process comprising: oxidation of NMST to give crude NMSBA; optional partial purification of crude NMSBA; conversion of
10 NMSBA to NMSBC; reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione; a distillation step; formation of potassium enolate mesotrione solution; one or more purification steps; and crystallisation of mesotrione.
- 15 15. A process for preparing mesotrione, said process comprising: oxidation of NMST to give crude NMSBA; optional partial purification of crude NMSBA; conversion of
20 NMSBA to NMSBC; reacting cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) to form an enol ester followed by a rearrangement process to give mesotrione; formation of a mesotrione enolate solution; decantation, filtration and adsorption treatment carried out in any order; and crystallisation of mesotrione.